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AMSAT NEWS SERVICE
ANS-068

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to:
ans-editor at amsat.org.

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ANS-068 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 068.01
From AMSAT HQ SILVER SPRING, MD.
March 9, 2014
To All RADIO AMATEURS
BID: $ANS-068.01

ISS HamTV Success (3-8-2014)

On Saturday, March 8 test transmissions were made on 2422.0 MHz using the HamTV equipment on the International Space Station (ISS).

The Digital TV signal was successfully received and web streamed to a global audience via the Britsh Amateur Television Club (BATC) server at http://batc.tv/ch_live.php?ch=4 There were four live web streams each from different receivers.

The HamTV transmitter is the culmination of over ten years work by dedicated volunteers to establish an amateur radio TV transmitter on the ISS. It uses patch antennas fixed on the Meteorite Debris Panels (MDP) protecting the hull of the ISS Columbus module. These antennas were installed while the Columbus module was being constructed. A fund-raising campaign took place during 2005-7 to raise over 65,000 Euros for the antennas. Individual radio amateurs from around the world donated generously as did several organisations including AMSAT-UK and the RSGB.

The main mission of HamTV is to perform contacts between the astronauts on the ISS and school students, not only by voice as now, but also by unidirectional video from the ISS to the ground.

HamVideo is the name of the onboard DATV S-band transmitter. HamTV is the name of the complete system, comprising DATV downlink and VHF voice uplink. Kaiser Italia SRL was the prime-contractor for the design and development of the flight and ground segment
http://www.kayser.it/index.php/exploration-2/ham-tv

Read the HamTV overview by Gaston Bertels ON4WF
http://tinyurl.com/HamTVoverview

Join the ISS HamTV Yahoo Group
http://groups.yahoo.com/group/HamTV

Webstream of the TV transmissions
http://batc.tv/ch_live.php?ch=4

ARISS-EU HamTV Bulletins
http://www.ariss-eu.org/

HamTV on Facebook
https://www.facebook.com/Hamtvproject

[ANS thanks the HAM-TV comissioning team, ARISS, and AMSAT-UK for the above information]

ISS Ham Video now installed and ready for commissioning (3-6-2014)

The Ham Video transmitter was installed in the Columbus module of the International Space Station (ISS) on March 6, 2014 at approximately 10.00 UT.

The transmitter was powered on briefly and all control LEDs were nominal. Ham Video is declared ready for Commissioning.
The first Commissioning step is planned March 8, 2014. Using call sign OR4ISS, crew will power on the Ham Video transmitter in configuration 1:

- ARISS antenna 41
- Frequency 2.422 GHz
- Symbol rate 1.3 Ms/s

The transmission will start shortly before the pass of the ISS over Western Europe at approximately 13.27 UT.

Acquisition of signal (AOS) at Matera ground station in south Italy will be at approximately 13.29 UT.

Matera will receive the Ham Video signals with 3 different receivers. The output of each receiver will be web streamed over BATC channels ISS1, ISS2 and ISS3.

The ARISS ground station IK1SLD, located in Northern Italy, will also receive the Ham Video signals and stream the video over BATC channel ISS4.

The BATC server is available at http://www.batc.tv/

On BATC you can do the following:

- select ISS
- click on one of the ISS channels
- click on Multi screen selector
- select the channels you wish to watch
- click on Watch.

When multiscreen appears, volume is turned down by default. Turn the volume up using the volume control slider below the image.

During the pass, different configurations will be tested with ARISS antenna 41. After the pass, the Ham Video transmitter will stay powered on in configuration 1 (see above) till the following Commissioning step, which is planned Sunday March 9, 2014 at approximately 12.40 UT.

For about 24 hours, the DATV signal will be transmitted permanently, but the camera will be powered off. The reason is, that the camera is battery powered and no provisions are made for frequent battery replacement. This mode is called “blank” transmission.

Sunday March 9, the transmission will start shortly before the pass of the ISS over Western Europe at approximately 12.39 UT.
During Commissioning step 2, different configurations will again be tested, this time with ARISS antenna 43. The Matera ground station and IK1SLD will stream the video over the BATC server.

The plan is to resume blank transmission immediately after the pass over Matera and to continue permanent transmission for one week, till Sunday March 16, 2014. The frequency will remain 2.422 GHz, but antenna ARISS 43 will be used.

Reports on reception of blank transmissions are very welcome.
Reports can be filed via this webpage:
http://www.spaceflightsoftware.com/ARISS_FSTV/submit.php

Participants using the Tutioune receiving software, developed by Jean Pierre Courjaud F6DZP, can record as well as stream detailed parameters of the received signal. Please see:
http://www.vivadatv.org/

Webstream of the TV transmissions
http://batc.tv/ch_live.php?ch=4

ARISS-EU HamTV Bulletins on Facebook
http://www.ariss-eu.org/

HamTV https://www.facebook.com/Hamtvproject

[ANS thanks ARISS's Gaston Bertels, ON4WF and AMSAT-UK for the above information]

Satellite TLE Object ID’s

Nico Janssen PA0DLO reports the process of producing Object ID’s for newly launch satellites has changed recently.

Writing on the AMSAT Bulletin Board (AMSAT-BB) he says:

It seems that the Joint Space Operations Center (JSpOC) has changed some of their policies lately. After the launch of multiple small satellites late last year it took a long time to get them all identified. Apparently they don’t want to leave all the TBAs in their database for a long time, so now they use a different approach: they randomly assign the names of all satellites of a launch to the observed objects and then wait for reactions from the users of the satellites to see if the assignments are correct.

This is how e.g. the Cubesats, that recently were launched from the ISS, got ‘identified’ only a few days after their launch. So of course now we find that some identifications are wrong.

Doppler measurements clearly show that the following IDs are correct:
Object 39568, 1998-067EM, is LitSat 1
Object 39569, 1998-067EN, is LituanicaSat 1.

I am trying to get these corrected.

In the past the policy was to assign the ‘A’ object to the main payload of a launch. Secondary payloads, like Cubesats, would then get ‘B’, ‘C’, etc. So if the main payload initially was linked to the wrong TLE set, this required some swapping of TLE sets some time after the launch. Now they have decided to prevent this confusion by simply leaving the main payload assigned to another object than ‘A’ if required. Therefore the GPM satellite now is assigned to 2014-009C and this will not change anymore.

Satellite TLE Lottery Begins
http://amsat-uk.org/2014/03/01/satellite-tle-lottery-begins/

Satellite Tracking
http://amsat-uk.org/beginners/satellite-tracking/

[ANS thanks AMSAT-BB, AMSAT-UK and Nico Janssen, PA0DLO for the above information]

FUNcube-1 (AO-73) 100+ days in orbit

Last weekend FUNcube-1 (AO-73) reached the milestone of having been in space for 100 days – actually that should be clarified to mean “terrestrial” days as the spacecraft itself has been subjected to more than 1500 day/night cycles during this time.

We are very grateful to the 500+ stations who have been providing FUNcube-1 telemetry data to our Data Warehouse. We now have more than 1GB of data in the repository – this is an amazing effort and achievement from a spacecraft which is only transmitting at 1200bps.

Thanks everyone and please keep it coming:)

From all the telemetry we can see that the spin rate decreased for a time but now is speeding up again. External temperatures span a range of 50C between the end of the sunlit phase and the end of the eclipse period. Even inside the spacecraft the temperatures range over 25C.

All the subsystems continue to work well and are “well in the green”.

The increased solar activity is certainly having an effect on the downlinked signal on many occasions. During such disturbances the signal appears to be being affected by ionospheric scintillation which distorts the BPSK stream and makes decoding much harder for some minutes at a time. This effect is not just apparent near the magnetic poles as can be seen in this paper: http://waas.stanford.edu/papers/IWG/sbas_iono_scintillations_white_paper.pdf

Users in the Northern hemisphere will have noticed that the evening passes in amateur mode are becoming shorter as the spacecraft enters sunlight again near the pole. This effect will increase as the season progresses and we will be testing a plan to change the operating schedule in a few weeks time. This test will involve placing the spacecraft into continuous amateur/transponder mode for a number of orbits – probably over a weekend.

Especially for educational users of FUNcube, we have placed all our schools outreach material on one page for easy reference. It can now all be found here: http://funcube.org.uk/education-outreach/

[ANS thanks AMSAT-UK for the above announcement]

Mass Launch of 437 MHz Satellites

The largest ever launch of 437 MHz satellites is planned for March 16 at 0841 UT when 128 Sprite satellites will fly on the SpaceX Falcon 9 CRS 3 mission to be deployed into a 325×315 km 51.5 degree inclination orbit. You should be able to watch the launch live on NASA TV.

The project was originally conceived by AMSAT-UK member Michael Johnson M0MJJ at Cornell University. Michael was the first project manager who specified many aspects of the project, making it technically and financially viable. He left the project in 2012 to found PocketSpacecraft.com.

A Sprite is a tiny, 3.5 by 3.5 cm, single-board spacecraft that was developed by Zac Manchester KD2BHC.

Each Sprite has a microcontroller, radio, and solar cells and is capable of carrying single-chip sensors, such as thermometers, magnetometers, gyroscopes, and accelerometers.

The 128 Sprites are carried in a 3U CubeSat called KickSat. They are stacked atop a spring-loaded pusher and secured by a nichrome burn wire system.

On reaching orbit KickSat will perform a de-tumble maneuver and establish communication with Cornell University's ground station. After check-out, the spacecraft will be put in a sun-pointing attitude and spun up to maintain that attitude.

A command signal from the ground station will then trigger the deployment and the Sprites will be released as free-flying spacecraft. After deployment, telemetry and sensor measurements from the individual Sprites will be received through Cornell's ground station in Ithaca, NY, as well as several other amateur ground stations around the world.

Due to the low orbit Sprites will have a short lifetime before they reenter the atmosphere and burn up. In the best-case scenario the orbital lifetime could be six weeks but realistically it may be considerably shorter depending on atmospheric conditions, maybe a matter of days.

All the Sprites operate on a single frequency of 437.240 MHz and use Code Division Multiple Access (CDMA). The transmitter runs 10 mW output of Minimum Shift Keying (MSK) modulated binary data with each data bit modulated as a 511 bit Pseudo-Random Number (PRN) sequence. The ITU emission designator is 50K0G1D.

The KickSat CubeSat has downlinks on 437.505 MHz and 2401-2436.2 MHz.

KickSat Sprite Ground Station by Andy Thomas G0SFJ
http://kicksat.wordpress.com/support/kicksat-ground-station/

British Interplanetary Society: Sprite Technical Summary
http://www.bis-space.com/2013/03/09/9301/kicksat-technical-summary

KickSat project information
http://zacinaction.github.io/kicksat/

BBC Worldwide TV interview with Zak Manchester KD2BHC. Unfortunately this is censored in the UK only overseas viewers can see it. A proxy server may be a way around it.
http://www.bbc.com/future/story/20140128-the-smallest-spacecraft-in-orbit

Check this site for the latest CRS 3 launch date
http://spaceflightnow.com/tracking/

Pocket Spacecraft
http://www.pocketspacecraft.com/

[ANS thanks AMSAT-UK for the above announcement]

Surrey Satellite Technology Ltd.(SSTL)– A 30th Birthday Celebration For UoSAT-2, OSCAR-11

UoSAT-2 was launched on March 1st, 1984, from Vandenberg Air Force Base in the USA and carried some novel payloads, including a "Digitalker".

Today, UoSAT-2 still transmits its VHF telemetry on a regular 11-day cycle, although the satellite's batteries are exhausted after some

160,000 charge cycles and transmissions are now detectable only when it is in sunlight. However, the telemetry continues to be tracked by amateur radio satellite enthusiasts worldwide, using the predictable transmissions to help calibrate their equipment.

Following the successful first microsatellite launch of UoSAT-1 from the Surrey team in 1981, NASA again offered a second launch opportunity—but with only 6 months warning! Rising to the challenge and literally working day-and-night, the Surrey team comprising about a dozen researchers and AMSAT members designed and built the 70kg UoSAT-2 microsatellite just in time for the launch as a 'piggyback' passenger with NASA's LANDSAT-5. Incorporating many of the lessons learned from their first satellite, UoSAT-2 carried some novel experiments – a "Digitalker" speech synthesizer, specifically designed for school demonstrations of satellite telemetry and orbital physics, alongside experiments including magnetometers, an early CCD camera, a Geiger tube and a sensitive microphone to detect micro-meteoroid impacts.

In the days before GPS, UoSAT-2 provided a novel communication system for the 1988 Canadian-Soviet Ski-trek arctic expedition, a group of intrepid explorers from Canada and the USSR who crossed the Arctic Ocean from Siberia to Ward Hunt Island, just off Canada, via the North Pole between March and June 1988. The position of the skiers' emergency beacon was calculated daily by US and Soviet COSPAS-SARSAT ground stations, relayed to the Surrey Mission Control Groundstation by telex, and uploaded to the UoSAT-2 Digitalker which then 'spoke' the latitude and longitude of the ski party via its VHF beacon. In a sun-synchronous, 650km low Earth orbit, UoSAT-2 flew over the pole every 98 minutes at which point the group could receive the broadcast from the satellite using their small handheld VHF radios that were designed to work at very low temperatures. The Digitalker communications system could also serve as an emergency channel in the event that all other radio links failed. Thousands of amateur radio listeners and schoolchildren also monitored the spoken messages from the Digitalker and plotted the path of the expedition – many using the then state-of-the-art BBC microcomputer! There's more about the Ski-trek expedition, and a recording of the Digitalker, on the expedition home page at

http://www.meerman.fsnet.co.uk/NorthPole/textpan.html

UoSAT-2 was one of the first satellites to prove that commercial grade microprocessors and memory chips, which had only just become readily available, mass produced and cheaper in the early 80s as part of the microcomputer revolution, could be used to build small, cost-effective yet capable satellites. The idea of taking advantage of commercially available technology and adapting it for space, instead of using expensive 'space-grade' components, was virtually unheard of at the time, but SSTL proved the concept was viable and has gone on to build a highly successful business.

Today, UoSAT-2 is the longest-serving of 13 satellites that SSTL and the Surrey Space Centre track from ground stations in Guildford, UK.

SSTL and the Surrey Space Centre have come very long way from those early days of the 1980s!

The SSTL infosite may be accessed at

http://www.sstl.co.uk/

[ANS thanks SatNews Daily and AMSAT-UK for the above information]

Two Close Calls For ZACUBE-1 CubeSat

The amateur radio ZACUBE-1 satellite, launched with FUNcube-1 on November 21, 2013, recently had two close encounters with space debris. The ZACUBE-1 team have issued this press release:

Week nine of the year will go down as quite an eventful week for ZACUBE-1 (TshepisoSat), literally dodging two bullets involving speeds in the kilometres per second range.

The first close approach notification arrived the morning of 25 February 2014 from the United States Joint Space Operations Center (JSpOC) through the The South African National Space Agency (SANSA) (A close approach notification is generated by the JSpOC to warn spacecraft operators when their spacecraft will come in close proximity to another object). The first order of business was the identification of the other object. In this case “SCC# 21422?. Our dance of death would be with the, now defunct, 2000 kg Russian built COSMOS 2151 launched in 1991. As ZACUBE-1 carries no propulsion system and with the COSMOS 2151 no longer functioning the only course of action was to closely monitor the situation.

It was determined that the close approach event would occur over the Antarctic and a search was started for possible ground stations that could listen for signals from ZACUBE-1 directly after the event. Help arrived in the form of our friends from the California Polytechnic State University in San Luis Obispo, California, United States. The Cal Poly ground station would see ZACUBE-1 approximately 30 minutes after the event and be able to listen for its transmitted telemetry beacon signal. In preparation ZACUBE-1 would be tracked and checked on the last two passes over South Africa (22:50 SAST 26/02/2014 and 00:26 SAST 27/02/2014) a few hours before the event to ensure that everything was OK and then again by the Cal Poly station.

With everything checking out and all systems nominal on the last pass over South Africa all we could do was wait for news from California.

Great success! With Cal Poly confirming that ZACUBE-1 was alive and well. We were able to further confirm this on the first pass over South Africa.

This would have been enough excitement for the week, but soon after verifying that ZACUBE-1 was OK we received our second close approach notification! This time involving a piece of debris from a METEOR 2-5 satellite. The plan would be much the same, but with the event taking place over Brazil we tried to make contact with some stations in Brazil. Unfortunately nothing was heard over Brazil, but we received notification of ZACUBE-1's signal from the University of Florida and again from the California Polytechnic State University.

We would like to thank everyone that helped out during this time, hopefully I did not leave anybody out. The folks from Cal Poly, University of Florida, the Brazilian radio amateurs that tried on very short notice and SANSA.

ZACUBE-1 carries a UHF beacon on 437.345 MHz and an HF beacon on 14099 kHz used to characterise the Superdarn antennas at the

Antarctic which study the ionosphere.

ZACUBE-1 information
http://www.cput.ac.za/fsati
http://www.amsatsa.org.za/

First image captured by TshepisoSat (ZACUBE-1)
http://amsat-uk.org/2013/12/15/first-image-captured-by-tshepisosat-zacube-1/

[ANS thanks SatNews Daily and AMSAT-UK for the above information]

OSCAR DEMO and Youth Forum MAY 3, 2014

The K4AMG Memorial Amateur Radio Club, Inc. in Chesapeake, Virginia is sponsoring a OSCAR Satellite seminar and OSCAR Demo at the Deep Creek Public Library on May 3rd.
Our portable OSCAR station will be operational from 0900 - at least 1700 EDT. An OSCAR and Youth Forum will be held in the main meeting room of the library at 1500 EDT.

We will feature an amateur radio display inside.
AMSAT- NA will provide a CUBE SAT simulator.

SATCOMS will be on OSCAR SATs:
FO 29, VO 52, SO 50, and AO 7 if available.
We will listen for AO 73 and the International Space Station.

We also plan to have a HF "GOTA" station on the air.
Please Join us, You've "GOTA" Get on the AIR

[ANS thanks Rich, W4BUE for the above information]

Upcoming AMSAT Events

Information about AMSAT activities at other important events around the country. Examples of these events are radio club meetings where AMSAT Area Coordinators give presentations, demonstrations of working amateur satellites, and hamfests with an AMSAT presence (a table with AMSAT literature and merchandise, sometimes also with presentations, forums, and/or demonstrations).

Friday and Saturday, 14-15 March 2014 – Acadiana Amateur Radio Association‘s Rayne Hamfest and ARRL Delta Division Convention at the Rayne Civic Center in Rayne LA. AMSAT will have a booth at this event, and there may be satellite demonstrations during the event.

Saturday, 15 March 2014 – Scottsdale Amateur Radio Club‘s Springfest in Scottsdale AZ (northeast of Phoenix). AMSAT will have a table at this hamfest, and satellite demonstrations are planned.
Demonstrations at this hamfest will be done using the call sign W1AW/7 as part of the ARRL centennial commemorations, and QSLing will

be handled by ARRL.

Saturday, 29 March 2014 – Radio Society of Tucson's 2014 Hamfest in Tucson AZ. AMSAT will have a table at this hamfest, and satellite demonstrations are planned.

Saturday, 5 April 2014 – The Greater Baltimore Hamboree and Computerfest 2014, including the Maryland Emergency Preparedness Expo 2014, at the Maryland State Fairgrounds in Timonium MD. AMSAT will have a booth at this hamfest, and other AMSAT-related events may be planned.

Saturday, 5 April 2014 – Amateur Radio Club of Parker County's Weatherford Hamfest at the Central Christian Church in Weatherford TX (west of Fort Worth). AMSAT will have a table at this event, and there may be satellite demonstrations during the hamfest.

Monday, 28 April 2014 – presentation at Franklin County Amateur Radio Club meeting in Greenfield MA by Barry Baines WD4ASW (AMSAT President)

Saturday, 3 May 2014 – Cochise Amateur Radio Association's Larry Warren Hamfest in Sierra Vista AZ (southeast of Tucson) – AMSAT will have a table at this hamfest, and satellite demonstrations are planned.

Saturday, 7 June 2014 – Kachina Amateur Radio Club's White Mountain Hamfest in Show Low AZ (eastern Arizona, south of US-60/AZ-77/AZ-260) – AMSAT will have a table at this hamfest, and satellite demonstrations are planned.

Friday and Saturday, 13-14 June 2014 – Ham-Com in Plano TX (north of Dallas)

Thursday through Sunday, 17-20 July 2014 – ARRL Centennial Convention in Hartford CT. AMSAT will host a day-long Satellite Workshop on Thursday, and have a booth at the convention along with an AMSAT Forum and demonstrations throughout the convention.

Saturday and Sunday, 30-31 August 2014 – Shelby Hamfest in Shelby NC (west of Gastonia and Charlotte) – Barry Baines WD4ASW (AMSAT President) will host an AMSAT Forum on Saturday of this weekend

Friday through Sunday, 12-14 September 2014 – ARRL Southwestern Division Convention 2014 in San Diego CA (north of the city center, near Montgomery Field airport & I-805/CA-163 interchange) – AMSAT will have a booth at this convention, there will be on-air demonstrations using satellites throughout the convention, and a presentation on amateur satellites and AMSAT

AMSAT maintains and updated list of known upcoming events at http://ww2.amsat.org/?page_id=218

[ANS thanks AMSAT-NA for the above announcement]

ARISS News

Recent Contacts:

A direct contact between astronaut Mike Hopkins KF5LJG and students at Rock Bridge Elementary School, Columbia, MO, USA was successful Wed 2014-03-05.

A direct contact with students at Central Square Middle School in Central Square, NY, USA was successful Mon 2014-03-03.

A direct contact with students at Musashino Elementary School of Hamura-shi, Hamura, Japan was successful Sat 2014-03-01.

A direct contact with students at Exploration Place, Wichita, KS, USA via WØSOE was successful Fri 2014-02-28.

Next planned event(s):

1. A direct contact with students at H. J. Cambie Secondary, Richmond, British Columbia, Canada, via VE7RAR is a go for: Thu 2014-03-13 17:04:41 UTC 54 deg.

HJ Cambie Secondary is a public school in the Richmond School District in British Columbia. We enroll approximately 700 students from grade 8-12. Cambie is comprised of a diverse cultural population of students. The student population of Cambie is composed of many different cultures along with thirty different language groups – 67% of our student population speaks a language other than English at home.

Cambie students are known for being strong leaders in our community. We offer a variety of courses in Mathematics, Sciences, Social Studies, the Arts, Business Ed, Athletics, and Modern Languages. Cambie has a thriving Leadership program that begins in Gr 8 with our Pathways program. Students in our leadership program give back a great deal to our community and fundraise for local charities. We have a strong Health Science program with work experience opportunities for our students and First responder training. In addition, Cambie has a world-class robotics club who competed at the World Robotics Championships last year in Orlando.

Cambie students are comparing the uniqueness of the ARISS contact to the first steps on the moon! This is a once in a lifetime experience for them and big on the "coolness factor"!!! We feel like we have won the lottery! This opportunity has brought a new energy to our classrooms. The staff and students are engaging in learning on levels that transcend the classroom walls. Music classes are performing space theme songs, computer CADD classes are designing digital mission patches, foods classes are learning about nutrition in space and our Health Science students are discussing how physiology is affected with space travel! The engagement opportunities the ARISS contact has provided our school are endless. We are celebrating the March 2014 ARISS contact with a 1.5 hour live show with speakers from MDA (makers of the Canadarm) and Urthecast (who’s cameras were just installed on the ISS), and interactive shows from Science World and the HR MacMillan Science Centre. Our ARISS contact is being video simulcast to a second gym in our school (where many elementary students are also joining us), and broadcast to the web where other schools across the district (and world) will be watching the live video feed!

2. A direct contact with students at Warren Consolidated Schools, Warren, MI, USA via W8HP is a go for: Fri 2014-03-14 16:22:57 UTC 59

deg.

The mission of the Warren Consolidated Schools (WCS) district, in partnership with families and community, is to achieve a level of excellence in teaching and learning which enables all students to become knowledgeable, productive, ethical, and successful citizens. To help meet that goal, WCS supports programs in Science, Technology, Engineering, and Mathematics (STEM), which give students a real hands-on experience in education.

The Middle School Mathematics Science Technology Center [(MS)2TC] has been built on the Warren Consolidated Schools district's internationally successful high school, the Macomb Mathematics Science Technology Center (MMSTC). While the high school program integrates seamlessly mathematics, science and technology, the middle school program integrates mathematics, science and informational literacy (reading and writing) with technology infused into each area. Both programs provide students with real-world, project-based learning activities that challenge their thinking, broadens their understanding of the world, and stretches their knowledge base while meeting the developmental needs of the students they serve.

The (MS)2TC student population consists of students from five different middle schools within the WCS district while the MMSTC student population draws from eleven different school districts within the county of Macomb in southeastern Michigan. Both schools serve a diverse community of students who come from various socioeconomic and ethnic groups.

The program goals of the MMSTC and (MS)2TC are to research, design, implement, and develop a powerful, unique learning environment and experience for high achieving students at the middle school and high school level that integrates mathematics, science, English language arts, and technology. To achieve this goal we have created a curriculum framework based upon the Next Generation Science Standards (NGSS) which integrates mathematics and literacy standards mirrored in the Common Core State Standards (CCSS).

ARISS is an international educational outreach program partnering the participating space agencies, NASA, Russian Space Agency, ESA, CNES, JAXA, and CSA, with the AMSAT and IARU organizations from participating countries.

ARISS offers an opportunity for students to experience the excitement of Amateur Radio by talking directly with crewmembers on-board the International Space Station. Teachers, parents and communities see, first hand, how Amateur Radio and crewmembers on ISS can energize youngsters' interest in science, technology, and learning. Further information on the ARISS program is available on the website
http://www.ariss.org/
(graciously hosted by the Radio Amateurs of Canada).

[ANS thanks ARISS for the above update]

Satellite Shorts from all over

N5AFV Upcoming Operation from California DM13

Thursday, March 13, 2014 through Sunday March 16, 2014 N5AFV will be in southern California DM13. Plans are to operate SO-50 passes when the schedule permits. Operating equipment will be an Icom W32A HT with a telescoping AL800 antenna. Satellite regulars N6NUG and WA6DIR are often active from DM12 and DM14 respectively, but DM13 is not activated as frequently on the satellites.

Great Houston Hamfest Activities

The Houston AMSAT Group will have an AMSAT booth and satellite demonstrations at the Greater Houston Hamfest on Saturday March 22, 2014. The satellite demonstrations will take place during the morning hours probably on FO-29 and SO-50. Other satellites may also be used if conditions permit. The Greater Houston Hamfest continues to grow and attendance is approaching one thousand persons.

[ANS thanks Allen Mattis, N5AFV for the above information]

HAM TV commissioning, Web-Video Link

Video from the HAM-TV Control Room in Italy during the commissioning
http://www.youtube.com/watch?v=f_tYmZOoRn4

[ANS thanks ARISS and Francesco, IK0WGF for the above information]

/EX

In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status. Contact Martha at the AMSAT Office for additional student membership information.

73,
This week's ANS Editor,
Joe Spier, K6WAO
k6wao at amsat dot org